

Way Down Under!

By Don Van Veldhuizen

Last year, I was fortunate to be asked to help with a wastewater plant at the bottom of the world. McMurdo Station is the farthest south a ship can travel and is located on Ross Island due south of New Zealand. Ross Island (off the coast of Antarctica) receives goods by ship for about two months after an icebreaker clears a channel, otherwise the only goods and transportation is from the air. After some unscientific calculations, I figured it to be the second farthest place you could fly from Oregon. Flying in nearly a straight line, it took 24 hours of flying time to get there. The last 8 hours was in a 1969 C-130 Hercules from the New Zealand Air Force. When I arrived, the weather was perfect. The sun was shining at 10:30 pm as it usually does 24-hours a day during that time of the year. There was no wind and it was a balmy 17 degrees F. Hardly the need for the 30 lbs of cold-weather gear that I was issued in New Zealand. After this trip I saw a totally new definition of the “fleecing of Americans.” It did come in handy when the wind chill hit 40 below.

Antarctica has the coldest average temperatures than any other continent. It is also the highest continent (the South Pole is 12,000 ft above sea level). Another well-known bit of trivia, on average it gets less precipitation than the Sahara Desert. The dry air and the extreme cold improve the visibility to a minimum of 80 miles when the wind is not blowing up too much ice and snow. Mountains that appear to be hills are often over 10,000 feet tall. Mt. Erebus, an active volcano on Ross Island is over 12,000 feet, but looks about 5,000 to 6,000 feet tall.

Mt. Erebus is a story in itself. This volcano is one of two in the world that has a constant pool of lava in its crater. It often erupts several times a day. On a trip away from McMurdo, I was able see one of these eruptions. It is mind boggling that such a thing could exist in such a climate. Scientists from all over the world study this one mountain.

McMurdo is the largest research station on the continent of Antarctica. It is operated by Raytheon Polar Services Corporation for the United States

Antarctic Program. The sole purpose of the station is for research. The reason for all the personnel there is to support the scientists. Most of the day-to-day supplies are flown in while larger items come in by ship. C-130s fly here a minimum of three days a week when weather permits bringing in people and goods. Even the people are packed in like sardines.

The United States has taken a lead role in protecting the environment in Antarctica. From multiple recycle bins to take the place of a single trash can, to self-imposing discharge limits for the effluent of their wastewater treatment plant. Everything that is transported into McMurdo is transported out, even the sludge from a 131,000 gallon-per-day activated sludge treatment plant.

The Ashbrook extended air activated sludge treatment plant was made here in the Northwest and shipped to McMurdo. It was placed on-line in 2002 and was the first wastewater treatment plant in Antarctica. It consists of three trains with each able to operate independently. This was necessary as the population varies from 120 in the winter to greater than 1200 in the summer. This is one of many challenges facing the operation of the plant. Others include high BODs, high peak flows, high oil and grease content and occasional slug loads of septic sludge. The most significant challenge is consistency of operation due to the isolation of the facilities.

BODs coming into the plant are typically between 800 and 1000mg/L. That is over 250% over design capacity. This gave problems for the coarse air diffusers that during high flows caused dissolved oxygen levels to drop off to nearly zero. The peak flows, although under design capacity, caused excessive turbulence in the Imhoff cone clarifiers washing solids over the weir. Influent oil and grease typically exceeds 60 mg/L, and remote lift stations gave a slug load of septic sludge every few days. These in themselves would be a major challenge. If there is a major breakdown at the plant or any other problem that needs outside help, it may not arrive for months. Now throw in changing operators every six months, and loadings that vary as much as 10 fold. Sound like something you may be interested in?

It takes a special type of person to deal with the challenges of such a job. Typically, this person loves a challenge, is self-motivated, and eager to learn. The list goes on to include someone who does not mind working long hours alone, but living in close proximity to others, so has a lack of privacy; a person who can deal with the harsh environment and in winter, months of darkness. Not to paint a bleak picture, the encouragement and support from co-workers show such a strong commitment to the team. The friendships developed here are strong and often life-long. It is also an opportunity for the right person to achieve some financial dreams, as you would not have to worry about many of the costs associated with living in the states. Finally, the beauty of the ice and mountains is unsurpassed. Together, as any position, there are good and bad things to deal with. Some found the good to outweigh the bad and keep returning to the ice. Some have been down there every year for 15 or more years. As for me, under the right conditions, I would “give it a go” down there. If I was not married, and desired to see the world during the off seasons, I would most likely seize this opportunity.